

U.S. Environmental Protection Agency, Region 9
Drinking Water Protection Section,
Mail Code WTR-3-2
75 Hawthorne Street
San Francisco, CA 94105
Attn: Nancy Rumrill

2/15/2015

Dear Ms. Rumril:

I am writing regarding the Class III Underground Injection Control (UIC) Area Permit for Florence Copper Inc. I am opposed to this permit and request you rescind all permits for the following reasons.

Florence Copper in their presentations in support of this permit fail to tell the public the history of test facilities and copper mining in Arizona and the world. The 90 day test facility by BHP five years ago has contaminated the ground water and aquifer in that area. Please refer to Mr. Daniel Johnson's letter from Curis Resources of 1/23/2012 to Ms Rumrill (copy enclosed). Sulfate levels are 7 times, magnesium levels 2.4 times and TDS 2.4 times the alert levels and this test was a very short 90 day time period not 2 years. This is after 14 years. The values appear to remain or increase at or above alert levels over time. The amazing thing about this notification process is that it does not include testing for arsenic, lead, sulfur and radionuclides. I also refer you to Paul Newman's letter from the Arizona Corporation Commission of 5/31/2012 to Harvey Darwin, ADEQ (copy enclosed). He states the PTF proposed by Florence Copper allows arsenic at 50 ppb whereas the drinking water standard is 10 ppb. In addition there are other chemicals that are allowed to exceed drinking water levels. The cost could be 19,000,000 and average annual treatment and monitoring costs may reach 477,614. Florence Copper does not mention that BHP is involved in litigation concerning groundwater contamination resulting from mining operations near Pinal Creek/Miami Wash area in Arizona to seek equitable allocation costs from various previous operators. The Federal District Court, District of Arizona required groundwater remediation from the various mining companies that operated in that area up to 170 million. A water treatment plant was constructed in 1999 and as of 2007 the total pounds of heavy metals removed were 2,144,911 from the aquifer site by the LPC Water Treatment Plant. Work is ongoing to rectify the situation that began 36 years ago. Enclosed are copies of the Pinal Creek Water Quality Assurance Revolving Fund Site, 2 pages and 7 pages. Can you imagine having to build a multi-million dollar water treatment plant in the middle of the Town of Florence to remove heavy metals? I hope we are not that crazy. BHP has sold this Pinal mine to Capstone Mining, Vancouver Canada. I am sure they want to distance themselves from this disaster. Reference Model Wyoming In Situ Uranium Mining Operation Cited For Multiple Violations report and Dr. Gavin Mudd's In Situ Leach (ISL) Uranium Mining Method Far From Benign, copies enclosed that demonstrate the problems with in situ mining. An article from Arizona Star by Tony Davis regarding an acid spill from mine near Clifton, AZ, copy enclosed. There was also an acid spill near Miami, AZ but I did not save the article. Two letters from the Gila

River Indian Community opposed to the PTF and mine, copies enclosed. There are other situations where Florence Copper does not address facts and information. This misleads the public about in situ and mining in general.

Let's take a look at the technical ability and history of Florence Copper and their owner Taseko. Taseko purchased Curis Resources by offering X number of Taseko shares for Curis shares last year. Taseko received all of the assets and liabilities of Curis including Florence Copper. Florence Copper has never mined anything in situ or otherwise. Taseko has one open pit mine in Canada. Taseko has no history of in situ mining. Florence Copper is a name only to confuse the public in Florence that it is a local company. This lack of experience causes serious mistakes, witness the acid spill from a mine near Clifton, AZ. It is said this was caused by an employee working for an experienced mining corporation and not a bunch of individuals working for a company with no history of in situ mining. What would prevent a worker from injecting a much stronger acid solution during the injection process? If Florence Copper and now Taseko had the technical ability they would not need a PTF and would be able to answer the 88 deficiencies on their application of 12/20/2011. In addition there were 69 deficiencies on the PTF application. This demonstrates a lack of technical ability. Taseko adds nothing to this experiment. Would you hire an inexperienced contractor to build a house? The community of Florence is being set up for a disaster.

The Financial capacity of Taseko and Florence Copper is not adequate. Taseko is a speculative company and would be classified as a penny stock. Taseko's total market capitalization is 177.45 million. Hardly enough to cover 170 million in remediation costs at Pinal Creek. Profit for last year minus 20 cents. Total assets minus liabilities plus 186 million. A bond of 40 to 80 million should be required before operations begin. Taseko and Florence Copper have no other assets in the US that could be attached in case of environmental damage. Taseko and Florence Copper do not appear to have the financial means to finance the PTF. Show me the money! One of the things that will happen over the next 20 years is the price of copper will decrease. Copper hit a price of well over 4 dollars a few years ago. It is now 2.57 dollars and heading to 1.50. At some point it will be unprofitable to mine and our community will be stuck with this uncertain situation. There is no shortage of copper. There is a surplus. When the Resolution Copper Mine in Arizona comes on line it will supply 1/3 of the copper demand in the US. This is the largest copper deposit in the US. Surely the water providers, water users in Florence and our community are not protected

Compliance with Arizona aquifer water quality standards is missing from this PTF. There is no new technology that would ensure compliance with Arizona aquifer water quality standards. They are using the same old technology that has contaminated aquifers all over the world. Neutralizing the site and rinsing the aquifer and ground water does not restore these resources to pre-mining levels. Testing is inadequate throughout the PTF. Baseline standards of the aquifer have not been established and Florence Copper is not required to return the aquifer to these standards. ADEQ has permitted Taseko and Florence Copper to violate the Safe Drinking Water Standards with this PTF. Taseko, Florence Copper and the mining industry will use this PTF and set up a situation where

they can eventually use and equate 2 years of operating a limited control PTF situation to a full blown in situ 20 year mine. The PTF is not a valid test. There is no comparison and the PTF should not be allowed to test something that is not relevant to their ultimate objective. This will put our water at risk over two years and possibly over many years in the future. No company should be allowed to test a communities water source for their gain.

The Florence Community is solidly against this PTF and any mining by Taseko and Florence Copper on their property or the state land. The property was purchased by Curis after all the property that they own and the property around the 160 acre state property was zoned as residential and light commercial. The town voted and approved this master plan. We have held two elections since Curis bought their property and in each case all council members and mayor candidates that were opposed to the mining were elected. Not one candidate that was for the mine was elected. The majority of people that live in our community are against this PTF and mine. This was the main issue of these elections. We have the right as a community and individuals to determine our destiny. As a community we have made that decision and request the EPA to honor this decision. The bulk of the people that you saw at the meeting that were for the mine were vendors, employees of Florence Copper, mining engineers and others with self interests. In 1998 when BHP had approval for their test facility there were no houses in this area. BHP owned most of the land and hence there was no opposition. I think BHP pulled out because in their testing they realized that they would eventually pollute the ground water and aquifer, not because the price of copper was low. BHP is a 100 plus billion company and could have held this property forever without any effect on their balance sheet. If this asset was so valuable they would have held onto it. They did not want to take the chance for millions of dollars in remediation costs. They got off with one million dollars that follows the property for eventual remediation. I have doubts about the value of the property. I think the mining industry wants this to happen as an experiment to see if in situ mining can get a firm grip on Arizona. If we continue to let the mining industry contaminate our water sources then the future of Arizona will cease to exist in the 21st century. This is not the 19th or 20th century where environmental concerns were secondary, witness Pinal Creek. This is not an economic or jobs issue like the supporters of the mine want everyone to believe. This is an environmental and water issue and the key to the survival and growth of Florence.

The State Water Quality Appeals Board rejected the Florence Copper mine permit. The Board agreed with Administrative Law Judge Diane Mihalsky that ADEQ acted unreasonably, arbitrarily, unlawfully and with clearly invalid technical judgment in issuing the permit. Numerous inadequacies were found. There were 6 major defects which are available to all as public records. See Johnson Utilities newsletter, Volume 12, copy enclosed.

I live in the Merrill Ranch at Anthem Community. Currently there are over 2000 homes in this community with more than 6000 to come over the next ten years if we can stop this insane desire by the mining industry to turn Florence into a mining town. There are thousands of people and children that live here. Drive through Anthem at Merrill

Ranch, tour both union centers, hospital, shopping center and school. You will see a modern 21st century community that business and home owners have invested hundreds of millions to add to the beauty and value of the Florence community. No mine can compare to what is being built at this site. This is what is at risk and the future of our community. An in situ mine will never come close to adding this kind of value to Florence. Instead it will reduce the value of this community and cause residential and business development in this area to slow and completely stop around the PTF. If the PTF is allowed to proceed, Southwest Value Partners and other developers will not be able to proceed with their plans for 2 years and possibly forever. They cannot wait an undetermined length of time to develop their properties. If Pulte cannot sell houses at Anthem at a profitable rate because of the PTF then they will leave. People that are in the market for a residence or retirement home will look elsewhere when they discover that an in situ mine is a few miles away. Some people currently living here will leave if the PTF is approved. Florence competes with all other retirement communities in Arizona and the US. We will not be competitive with an in situ mine a few miles away in the middle of our town. When a builder leaves a town he leaves homes and businesses with people in them, jobs that are permanent and an environment that is not contaminated. When a miner leaves he leaves empty buildings with no people in them, no jobs, and water, land and an environment that is generally contaminated. Look at the history of mining towns and tell me differently. As a community and individuals, we have the right to determine our destiny. The Town of Florence has made that decision and requests that the EPA rescind the Class III UIC Area Permit to Florence Copper and Teseko now and any time in the future so we can get on with our lives and build the future of our town.

Kathryn Young
Armand Young

Armand Young

Kathryn Young

FOIA Exemption 6



January 23, 2012

Ms. Nancy Rumrill
U.S. Environmental Protection Agency
Region 9, Ground Water Office, WTR-9
75 Hawthorne Street
San Francisco, California 94105-3901

**Subject: 5-Day Notification and 30-Day Report of Alert Level Exceedance for Sulfate;
Underground Injection Control (UIC) Permit No. AZ396000001**

Dear Ms. Rumrill:

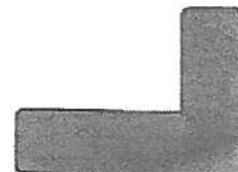
In accordance with UIC Permit No. AZ396000001, Curis Resources (Arizona) Inc. (Curis Arizona) is providing the U.S. Environmental Protection Agency (USEPA) with this notification of alert level (AL) exceedances for a well at the Florence Copper Project. Concurrent notification is also being made to the Arizona Department of Environmental Quality (ADEQ).

As you are aware, in February 2010, Curis Resources (Arizona) Inc. (Curis Arizona) purchased all of the assets of Florence Copper and the right to apply for the transfer of its permits to Curis Arizona, including the Aquifer Protection Permit (APP) and Underground Injection Control (UIC) Permit. Curis Arizona submitted a UIC permit application in March 2011 and although the permit transfer is not complete, Curis Arizona is assuming the compliance obligations of those permits.

The Florence Copper Project is a proposed in-situ copper mining facility. The facility has been inactive since a pilot test in 1998, which was performed in a very limited portion of the permitted area. The only on-going process at the facility is an evaporation impoundment which contains less than 10% of the liquid capacity. Only minor leakage has ever been recorded in the leak collection and recovery system, and none in the last five years.

The permit requires quarterly monitoring of four indicator parameters, fluoride, magnesium, sulfate and total dissolved solids (TDS). The quarterly parameters were selected on the basis of theoretical impact by the in-situ process. All four parameters would be expected to increase significantly.

Monitoring well P49-O was sampled on December 5, 2011. The results were reported on December 21, 2011 and alert level exceedances of magnesium, sulfate, and TDS were observed. A verification sample was collected on January 4, 2012. The confirmation results were reported on January 18, 2012. In accordance with permit conditions H.2 (Contingency Plans, Water Quality Exceedances at POC Wells), we are providing this 5-day notification and 30-day report.



The following concentrations were reported for the primary sample and verification sample.

WELL ID	SAMPLE DATE	ANALYTE	RESULT	ALERT LEVELS	UNITS
P49-O	12/5/2011	Magnesium	15	6.2	mg/L
P49-O	12/5/2011	Sulfate	1,280	181	mg/L
P49-O	12/5/2011	TDS	2,000	801	mg/L
P49-O	1/4/2011	Magnesium	15	6.2	mg/L
P49-O	1/4/2011	Sulfate	1,320	181	mg/L
P49-O	1/4/2011	TDS	2,000	801	mg/L

There are no primary maximum contaminant levels (MCLs) or Aquifer Quality Limits (AQLs) for the parameters.

Under prevailing conditions, P49-O is a cross-gradient, background well to the pilot test area. Since the facility is inactive, the increased concentrations are not believed to be related to permitted mining operations. The remaining indicator parameter, fluoride, decreased significantly, which is counter-indicative of an impact.

For the December 2011 sampling event, the pump in P49-O was replaced with a low-flow bladder pump. The increases in concentrations in P49-O appear to be an affect of the low-flow sampling methodology. The low-flow pump may be collecting the water sample from a distinct portion of the aquifer zone with higher concentrations which become diluted performing a typical three borehole volume purge. The concentrations are in fact similar to the ranges observed in nearby well M24-O for pre-mining, ambient conditions. Since the observed changes in concentrations are not believed to be related to the permitted activities, we believe no further action is required.

There were no other exceedances of alert levels in the monitoring network, with the exception of sulfate in M1-GL. This well is an upgradient, background well under prevailing conditions. Sulfate concentrations have increased over time as described in our notification letter dated October 19, 2011 and Third Quarter 2011 Report dated October 28, 2011. Concentrations of the other three indicator parameters remain well below ALs. The well is in monthly monitoring for the indicator parameters and sulfate concentrations continue to be above the set alert level. M1-GL is completed in a different aquifer zone and the elevated sulfate concentrations are not believed to be related to the changes in concentrations of P49-O.

The APP requires that monitoring frequency of P49-O be increased to monthly for the quarterly indicator parameters. Based on the analysis provided, we are requesting to resume quarterly monitoring for both well P49-O and M1-GL.

Ms. Nancy Rumrill
January 23, 2012
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We appreciate your consideration of this request. Please contact me at (520) 374-3984 should you have any questions regarding this report.

Sincerely,

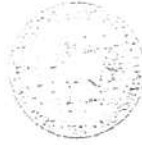
CURIS RESOURCES (ARIZONA) INC.

A handwritten signature in black ink, appearing to read 'Daniel Johnson', with a stylized flourish at the end.

Daniel Johnson
Environment and Technical Services Manager

BAS:ld
Attachments
cc: Florence Copper File

COMMISSIONERS
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BOB STUMP
SANDRA D. KENNEDY
PAUL NEWMAN
BRENDA BURNS



ARIZONA CORPORATION COMMISSION

PAUL NEWMAN
COMMISSIONER

Direct Line: (602) 542-3699
Fax: (602) 542-3708
E-mail: pnewman@azcc.gov

May 31, 2012

Henry R. Darwin, Director
Arizona Department
of Environmental Quality
1110 West Washington Street
Phoenix, Arizona 85007

Dear Director Darwin:

I am writing to express my concern with the possibility that the Arizona Department of Environmental Quality ("ADEQ") is about to issue a temporary or individual Aquifer Protection Permit ("APP") to Curis Resources for its proposed in-situ copper mine in Florence, Arizona. This matter involves environmental and economic threats to a Commission-regulated public service corporation, Johnson Utilities. The Commission has a duty to investigate this issue under Article 15, Sections 3 and 4 of the Arizona Constitution, which provide the Commission with authority to take actions to protect the health of Commission-regulated utility customers and to investigate the utility's affairs, respectively. I request that this letter be retained for and entered into the official public record for Curis' temporary and individual APP applications.

As I understand it, Curis' operation plan involves injecting sulfuric acid and releasing chemicals into an aquifer that Johnson Utilities uses to supply drinking water to customers from wells located just down the street from the Curis facility. I think you might see how this could raise some red flags. My concerns are three-fold:

- I. The health and safety of ratepayers in the event that Curis' containment system fails and catastrophic contamination of the water supply occurs.
- II. The health and safety of ratepayers as a result of contamination that will occur as a direct result of permitting the facility.
- III. Costs that will ultimately be passed to ratepayers for treating groundwater contaminants that currently are below levels required for treatment but will likely rise significantly above drinking water standards.

I. Catastrophic Failure

I understand that Curis proposes to inject roughly 5.4 billion pounds of sulfuric acid over the course of 20 years into fractured bedrock in an area where it can easily mix with the drinking water supply. Incidentally, that area is also adjacent to the Gila River and to residential subdivisions within the boundaries of the Town of Florence that are served by Johnson Utilities. I'm told that groundwater in the area flows in a northwesterly direction past the Curis property

toward Johnson Utilities' twelve wells and beyond. The nearest Johnson well is only 1.2 miles away. The nearest homes are only 1.5 miles away.

It's also my understanding that the acid used will essentially dissolve the ore where it exists in the earth, creating a toxic slurry of minerals and acid that can then be pumped back to the surface. So in addition to the acid and the copper, it seems we're talking about a potential release of other elements that, according to public records, Curis and ADEQ are aware of – such as arsenic, lead, sulfur, radionuclides, and others. If Curis fails to contain these elements within the oxide zone, I am very concerned that Johnson Utilities' wells will be contaminated. I also understand that in-situ mining, while fairly new to the copper scene, is a relatively popular and long-standing mining technique for other valuable minerals, like uranium. And the track record for protecting groundwater isn't good.

II. Permitted Contaminations

Another concern that has been brought to my attention is the fact that Curis' permit application would allow a number of chemicals to be released into the aquifer at levels that exceed drinking water standards. For example, Curis acknowledges that its operations will mobilize arsenic. The drinking water standard for arsenic is 10 parts per billion. But Curis proposes to ensure only that arsenic will not exceed 50 ppb – five times the drinking water standard – as it leaves the site. In fact, Curis anticipates arsenic concentrations in its wastewater at levels ranging from 50 to 6,600 parts per billion. If you issue a permit to Curis that approves the 50 ppb standard, Curis will not be obliged to protect drinking water quality. This regulatory gap may require ratepayers, rather than Curis, to incur significant costs for treating the groundwater to the drinking water standard.

III. Cost of Treatment

I am concerned that Johnson Utilities, and ultimately its customers, will be forced to incur significant costs to treat its drinking water for chemicals that it currently does not have to treat for (e.g. arsenic), because the APP permit will allow releases of chemicals into the drinking water that exceed current drinking water quality standards. Known for its conservative regulatory implementation cost projects, EPA estimated that to achieve the arsenic drinking water standard of 10 ppb, the total cost for a system serving 10,001 to 1,000,000 people is approximately \$19,000,000,¹ and the average annual treatment and monitoring costs may reach \$477,614.² EPA estimated that the costs translate to an average of \$24.41 per household served

¹ Stedje, Ph.D., Gerald D., *Arsenic in Drinking Water Rule Economic Analysis*, EPA 815-R-00-026 (Dec. 2000), p. 6-29, Exhibit 6-11.

² *Id.*, p. 8-21, Exhibit 8-21.

Henry R. Darwin, Director
Arizona Department of Environmental Quality
May 31, 2012
Page 3

by the water provider.³ Independent studies suggest that the cost per household may range between \$500⁴ and \$792⁵ per year.

As you can see, there are a number of issues that have great potential to severely impact the ratepayers served by Johnson Utilities. I would greatly appreciate your consideration of these serious concerns and await your thoughtful response.

Sincerely,

A handwritten signature in black ink that reads "Paul Newman". The signature is written in a cursive, flowing style with a large initial "P".

Paul Newman
Commissioner

cc: Sandra A. Fabritz-Whitney
The Honorable Tom Horne
Chairman Gary Pierce
Commissioner Bob Stump
Commissioner Sandra D. Kennedy
Commissioner Brenda Burns
Steven Olea
Janice Alward
Ernest G. Johnson
Rebecca Rios

³ *Id.*, p. 6-35, Exhibit 6-17.

⁴ Gurian, Patrick, et al., *Addressing Uncertainty and Conflicting Cost Estimates in Revising the Arsenic MCL*, Environ. Sci. Technol. 2001, 35, 4414-4420, 4416 (Table 1).

⁵ Raucher, Robert S. and Cromwell, John, *Safe Drinking Water Act: Cost of Compliance*, Mercatus Center, George Mason University, Working Paper #35, p. 21, Table 12.

eg. GOOG, iPhone, Yen, or Gold

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CHART](#)[SEC
FILINGS](#)[BALANCE
INCOME
CASH FLOW](#)**BHP » Topics » Pinal Creek/Miami Wash area**

This excerpt taken from the BHP 20-F filed Sep 14, 2009.

Pinal Creek/Miami Wash area

BHP Copper Inc (BHP Copper) is involved in litigation concerning groundwater contamination resulting from historic mining operations near the Pinal Creek/Miami Wash area located in the State of Arizona. BHP Copper and the other members of the Pinal Creek Group (which consists of BHP Copper, Phelps Dodge Miami Inc and Inspiration Consolidated Copper Co) filed a contribution action in November 1991 in the Federal District Court for the District of Arizona against former owners and operators of the properties alleged to have caused the contamination. As part of this action, BHP Copper is seeking an equitable allocation of clean-up costs between BHP Copper, the other members of the Pinal Creek Group, and BHP Copper's predecessors. BHP Copper's predecessors have asserted a counterclaim in this action seeking indemnity from BHP Copper based upon their interpretation of the historical transaction documents relating to the succession in interest of the parties.

A State consent decree (the Decree) was approved by the Federal District Court for the District of Arizona in August 1998. The Decree authorizes and requires groundwater remediation and facility-specific source control activities, and the members of the Pinal Creek Group are jointly liable for performing the non-facility specific source control activities. Such activities are currently ongoing. As of 30 June 2009, we have provided US\$128 million (2008: US\$125 million) for our anticipated share of the planned remediation work, based on a range reasonably foreseeable up to US\$170 million (2008: US\$170 million), and we have paid out US\$60 million up to 30 June 2009. These amounts are based on the provisional equal allocation of these costs among the three members of the Pinal Creek Group. BHP Copper is seeking a judicial restatement of the allocation formula to reduce its share, based upon its belief, supported by relevant external legal and technical advice, that its property has contributed a significantly smaller share of the contamination than the other parties' properties. BHP Copper is contingently liable for the whole of these costs in the event that the other parties are unable to pay.

BHP Copper has also filed suit against a number of insurance carriers seeking to recover under various insurance policies for remediation, response, source control and other costs noted above incurred by BHP Copper.

This excerpt taken from the BHP 20-F filed Sep 15, 2008.

Pinal Creek/Miami Wash area

BHP Copper Inc (BHP Copper) is involved in litigation concerning groundwater contamination resulting from historic mining operations near the Pinal Creek/Miami Wash area located in the State of Arizona. BHP Copper and the other members of the Pinal Creek Group (which consists of BHP Copper, Phelps Dodge Miami Inc and Inspiration Consolidated Copper Co) filed a contribution action in November 1991 in the Federal District Court for the District of Arizona against former owners and operators of the properties alleged to have caused the contamination. As part of this action, BHP Copper is seeking an equitable allocation of cleanup costs between BHP Copper, the other members of the Pinal Creek Group, and BHP Copper's predecessors. BHP Copper's predecessors have asserted a counterclaim in this action seeking indemnity from BHP Copper based upon their interpretation of the historical transaction documents relating to the succession in interest of the parties.

A State consent decree (the Decree) was approved by the Federal District Court for the District of Arizona in August 1998. The Decree authorizes and requires groundwater remediation and facility-specific source control activities, and the members of the Pinal Creek Group are jointly liable for performing the non-facility specific source control activities. Such activities are currently ongoing. As of 30 June 2008, we have provided US\$125 million (2007: US\$122 million) for our anticipated share of the planned remediation work, based on a range reasonably foreseeable up to US\$170 million (2007: US\$166 million), and we have paid

EXCERPTS ON THIS PAGE:

20-F	Sep 14, 2009
20-F	Sep 15, 2008
20-F	Sep 26, 2007
20-F	Sep 25, 2006
20-F	Oct 3, 2005

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out US\$58 million up to 30 June 2008. These amounts are based on the provisional equal allocation of these costs among the three members of the Pinal Creek Group. BHP Copper is seeking a judicial restatement of the allocation formula to reduce its share, based upon its belief, supported by relevant external legal and technical advice, that its property has contributed a smaller share of the contamination than the other parties' properties. BHP Copper is contingently liable for the whole of these costs in the event that the other parties are unable to pay.

BHP Copper has also filed suit against a number of insurance carriers seeking to recover under various insurance policies for remediation, response, source control and other costs noted above incurred by BHP Copper.

This excerpt taken from the BHP 20-F filed Sep 26, 2007.

Pinal Creek/Miami Wash area

BHP Copper Inc is involved in litigation concerning groundwater contamination resulting from historic mining operations near the Pinal Creek/Miami Wash area located in the State of Arizona, US. The details of this litigation are set out in footnote (c) to Note 21 'Provisions' in the financial statements.

This excerpt taken from the BHP 20-F filed Sep 25, 2006.

Pinal Creek/Miami Wash area

BHP Copper Inc is involved in litigation concerning groundwater contamination resulting from historic mining operations near the Pinal Creek/Miami Wash area located in the State of Arizona, US. The details of this litigation are set forth under the heading 'Information on the Company – Health, Safety, Environment and Community – Decommissioning, site rehabilitation and environmental costs'.

This excerpt taken from the BHP 20-F filed Oct 3, 2005.

Pinal Creek/Miami Wash Area

BHP Copper Inc is involved in litigation concerning groundwater contamination resulting from historic mining operations near the Pinal Creek/Miami Wash area located in the State of Arizona. The details of this litigation are set forth in Item 4B under the heading "Information on the Company – Health, Safety, Environment and Community – Decommissioning, Site Rehabilitation and Environmental Costs".



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Pinal Creek

Water Quality Assurance Revolving Fund ([WQARF](#)) Site

Boundaries:

The Pinal Creek WQARF (site) is located in the Globe-Miami area of Gila County, Arizona and has irregular boundaries. Within the southern portion of the site, the boundary follows and includes the entire mine sites of Freeport- McMoRan Miami Inc (FMI). These sites were formerly known as the Phelps Dodge Miami Mine and the Inspiration Mine. It also includes the mine sites of [BHP Copper, Inc.](#) (The [Miami Mine](#), the Copper Cities Mine, the Old Dominion Mine and related properties and the Solitude [Tailings](#)).

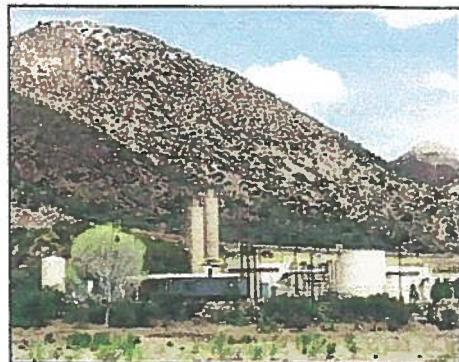
The southern boundary follows the southern margin of the floodplain of Bloody Tanks Wash through the town of Miami and the community of Claypool, and then turns south to include the BHP Solitude Tailings. The boundary follows the eastern margin of the floodplain of Russell Gulch and Miami Wash northward to the confluence with Pinal Creek. The boundary parallels both sides of upper Pinal Creek to the City of Globe, including the [Old Dominion Mine](#) and related mine properties in the Globe Hills.

North of the confluence of Miami Wash and Pinal Creek, the boundary parallels Pinal Creek on both sides including the floodplain of Pinal Creek plus a margin approximately 1,000 feet wide surrounding the floodplain as far north as Inspiration Dam. North of Inspiration Dam, the boundary follows the floodplain of Pinal Creek. The northern boundary terminates at the Salt River.

The site's geographic boundaries depicted on the [site map](#) represent the Arizona Department of Environmental Quality's (ADEQ) interpretation of data available at the time the map was constructed. The map is intended to provide the public with basic information as to the estimated extent of known contamination as of the date of map production. The actual extent of contamination may be different. Therefore, the boundaries for the site may change in the future as new information becomes available.

Site Status Update:

ADEQ continues to review source control [remedial investigations](#) (RIs) and [feasibility studies](#) (FSs) at the FMI and BHP Copper mining and processing facilities. Source control [remedial actions](#) are being implemented at all FMI and BHP Copper mining facilities. The site-wide stream sediment investigation is currently under review. FMI has submitted an addendum to their original feasibility study that addresses the Webster Gulch facilities including Webster Gulch tailings piles, the former Webster Lake bed, storm water management of the Lost Gulch arm of Webster Lake, Webster Lake sediments and [capping](#) and re-vegetation of the various piles and closed facilities.



Lower Pinal Creek Treatment Plant

FMI has begun construction on the Webster Lake In-fill Reclamation Project and the 27/28 Leach Dump In-fill Project. The Webster Lake Infill Project provides for backfilling of the former Webster Lake including an under-drain, isolation of lake sediments, re-grading of backfill, waste rock piles and tailings piles, surface water drainage, capping and re-vegetation of the lake bed, waste rock piles, and tailings piles. The 27/28 Leach Dump Infill Project will include a new leach solution impoundment for the 27/28 Leach Dump and capping, re-grading and re-vegetation of various waste rock piles.

FMI continues work on the Webster Lake In-fill Reclamation Project which is scheduled for completion in late 2014. FMI has also started reclamation projects at the #1, #5 Leach stockpiles and the #16 Waste Rock stockpiles. Future reclamation projects at various leach, waste rock and tailings stockpiles are in the planning stage, which runs through to 2021.

FMI is providing funding and technical assistance to the Town of Miami on their new wastewater treatment plant which is being constructed at the base of the #3 Tailings Pile adjacent to Miami Wash. The new plant will discharge treated wastewater for mine reuse, groundwater recharge and irrigation of the local golf course.

BHP Copper has submitted the RI report for the Solitude Tailings Impoundment which is currently under review. The tailings piles will have to be regraded, revegetated and significant improvements to the surface water conveyances will be conducted. Site-wide groundwater, surface water, and discharge monitoring are on-going. Approximately 80 to 100 wells, four surface water sites, and treated effluent from the Lower Pinal Creek (LPC) Treatment Plant are monitored on a monthly basis.

Community Involvement Activities:

Community outreach activities for this site are conducted by the Pinal Creek Group with ADEQ oversight and support. An open house was held in October 2002 prior to initiation of the remedial construction at the BHP Copper Inc.-Old Dominion Mine. The Pinal Creek Group routinely generates newsletters, press releases, and fact sheets, conducts briefings for interested parties, conducts tours of treatment facilities, and participates in interviews on local radio stations.

Site History:

1878-1970: Mining and mineral processing began in the Globe-Miami area in 1878 with the discovery of silver in the Globe Hills. By 1893, copper had replaced silver as the main commodity produced in the district, and continues to be today. Releases of contaminants from mine and processing sites started shortly after mining, milling, and smelting began.

Groundwater contamination was first discovered in the 1930s in the alluvial aquifer of Miami Wash. In the 1940s, groundwater contamination was discovered in the alluvial aquifer of Bloody Tanks Wash. The first public supply wells were contaminated in the late 1940s, and private wells along LPC were first impacted in the 1970s.

1979-1981: The first area-wide investigation of groundwater and surface water contamination was conducted in 1979-1981. Widespread groundwater and surface water contamination was documented. Releases of contaminants and hazardous substances have occurred from all of the major mining and processing sites from a variety of different sources, including, but not limited to, process solution impoundments, tailings piles, leach dumps, waste rock piles, spills, and as storm water runoff. Erosion of waste piles, especially tailings piles, has also resulted in the release of contaminants to water courses. Particulate fallout of wind-blown tailings and from copper smelters in the area has also contributed to the spread of contamination at the site.

1986-1990: Source control actions began in 1986 under order from EPA for violations of the Clean Water Act. In 1989, the site was listed on the old WQARF Priority List by the state of Arizona. In 1989, the Pinal Creek Group (a consortium of Phelps Dodge, BHP Copper Inc., and Inspiration Consolidated Copper Co.) was formed to conduct the RIs and begin remedial actions. The groundwater RI began in 1990. In 1990, the interim remedial action (IRA) began which consisted of groundwater extraction from the alluvial aquifer at four locations.

1994: The Pinal Creek Group began a private well testing and replacement program, which continues today.

1997: Ecological and Human-Health risk assessments and the groundwater FS and Recommended Remedial Action Plan (RRAP) were completed by 1997. The RRAP proposed groundwater extraction at two locations, upstream and downstream containment of the plume, construction of two lime neutralization treatment plants, private well replacement, source control, and special well construction and abandonment requirements.

1997-1998: A consent decree governing the clean up was signed in 1997, and approved by the U.S. District Court in 1998. A WQARF administrative order to implement an early response action (ERA) was signed in 1998 to expedite construction of the LPC treatment plant, begin groundwater extraction at the leading edge of the acid-metal plume, and prevent further degradation of the perennial reach of Pinal Creek.

Initial source control remedial investigations and associated FSs were completed by 1998. Numerous source and exposure control actions have been implemented at the various mine Sites, including facility upgrades, groundwater extraction, groundwater containment, removal from service of solution impoundments, capping/covering of tailings, management controls, institutional controls, storm water controls and many others.

In October 1998, the site was placed on the WQARF Registry with an eligibility and evaluation score of 97 out of 120.

1999: In November, the LPC Treatment plant was completed and groundwater extraction at the leading edge of the acid-metal plume began.

2001: In January, a groundwater barrier (soil-cement-bentonite slurry wall) was constructed across LPC, which serves as the downstream containment of the plume. Full scale groundwater extraction began just above the barrier for neutralization and metal removal in the LPC Treatment Plant. In May, a second treatment plant (Diamond H Treatment Plant) was completed

to treat water captured from the Kiser Basin (upstream) containment. In June, a groundwater well field (Kiser Basin well field) that serves as the upstream containment of the acid-metal plume was completed, and groundwater extraction began.

2002: Remedial construction of the engineered cap of the BHP Copper Old Dominion Mine tailings and waste rock began to prevent acid-metal runoff from reaching upper Pinal Creek began.

2003-2005: Investigations into soil and stream sediment contamination began. The Phase I sampling of soil and stream sediment was completed in April 2004. The results of the Phase I soil and stream sediment investigations were submitted in November 2005. A risk assessment was included as part of that submittal.

Major construction was completed and revegetation of the piles began during the spring of 2004. Runoff sampling conducted during 2003 after capping of waste rock and tailings piles has documented major improvements in runoff water quality.

In spring 2004, revegetation of the BHP Copper Old Dominion Mine waste rock and tailings was completed. In early summer of 2004, a failure of the Diamond H pit wall threatened the Diamond H Treatment Plant which was subsequently deconstructed. A temporary batch plant was constructed nearby to allow for continued treatment of acid-metal groundwater from the Kiser Basin containment well field. In late 2004, a new location for the treatment plant was selected and in September 2005 design plans were prepared and submitted for review. The plant was relocated near the southeast corner of the Diamond H Pit. Stability analyses were conducted and the critical components of the plant will be constructed outside of any areas of high for slope and rock failure.

2005: In February, the Pinal Creek Group submitted a request to the ADEQ Water Quality Division to change the designate uses of a portion of perennial Pinal Creek. The request was to change the creek from aquatic and wildlife warm water to an aquatic and wildlife effluent-dominated stream. The Pinal Creek Group also requested dropping the fish consumption designation. In September, the Pinal Creek Group submitted a formal petition for the removal of the fish consumption designation from a portion of perennial Pinal Creek. Also submitted at that time, was a use attainability analysis for the fish consumption use. That same month, the Pinal Creek Group submitted a formal petition to re-classify a portion of Pinal Creek as effluent-dependent water.

In the spring, Bloody Tanks Wash, which is adjacent to the BHP Copper-Miami, was widened. The retaining wall that separated Bloody Tanks Wash from the former Miami Tailings No. 2 was removed and the tailings behind the wall were relocated onto the remaining tailings leftover from the previous reprocessing operation. The remaining tailings at the BHP Miami Unit lie outside of the 100-year floodplain.

During the summer, reclamation started of the remaining tailings at the BHP Copper-Miami Unit. The tailings began to be capped with clean fill, consolidated, regraded, and storm water channels and storm water and sediment ponds were being constructed. In the late part of summer, BHP began a site characterization/remedial investigation of the Solitude Tailings Impoundment located in Solitude Canyon (a tributary of Russell Gulch). The investigation

included soil [borings](#), test pits and groundwater [monitor well](#) installation. Samples were collected for chemical analysis, [agronomic testing](#), geotechnical testing and stability analysis.

2006: Early in the year, the capping and revegetation of the BHP Miami Unit No. 2 Tailings was completed. In mid-2006, Phelps Dodge-Miami began reclamation of the slag pile along Bloody Tanks Wash. The pile was re-graded, capped and re-vegetated.

As of April, approximately 105 million pounds of [heavy metals](#) (aluminum, beryllium, cadmium, cobalt, copper, iron, lead, manganese, nickel, and zinc) were removed from aquifers at the site. This water was treated and released to Pinal Creek, reused at the mines, or evaporated at the mines. The perennial and ephemeral reaches of Pinal Creek, Miami Wash, and Bloody Tanks Wash were removed from the State's list of impaired water bodies.

2007: During calendar year, approximately 2,144,911 pounds of heavy metals were removed by the LPC Water Treatment Plant.

2008: BHP has completed the removal and/or capping of numerous waste rock piles in the Copper Gulch drainage. Several piles were re-located to the BHP Miami [In-Situ](#) Mining facility where the waste rock will be leached within the confines of the hydrologic sink of the In-Situ and TJ pit.

2009: Freeport McMoRan, formerly Phelps Dodge, began construction on the Webster Lake Infill Project and the 27/28 Leach Dump Infill Project.

2010: The Pinal Creek Group has re-assessed the Pinal Creek flood elevations in the floodplain in response to flooding during the winter of 2009-2010 and in response to work conducted by a floodplain neighbor who was impacted by winter flooding. The work started in 2010 threatened to divert floodwaters towards the Pinal Creek Water Treatment Plant and potentially cause erosion and damage to embankments constructed by the Pinal Creek Group. The Army Corps of Engineers investigated the area which resulted in a work stoppage in the floodplain and the requirements for the neighbor to obtain a Clean Water Act 404 Permit.



**Water Treatment Plant at
Lower Pinal Creek**

2011 - 2012: FMI continues with construction of the Webster Gulch Reclamation Plan which, includes grading, covering, capping and revegetation of waste piles, flood routing of surface flows, and construction of subsurface drains.

Contaminants:

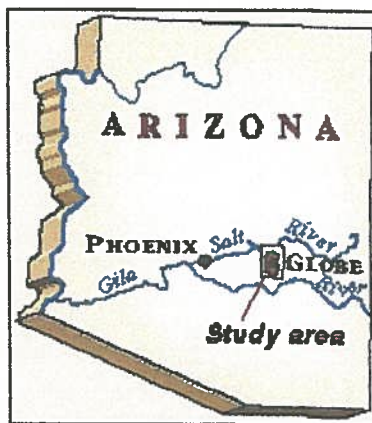
The major contaminants of concern at this site include [aluminum](#), [arsenic](#), [beryllium](#), [cadmium](#), [copper](#), [cobalt](#), iron, [manganese](#), [nickel](#), [sulfate](#), [zinc](#), and [sulfuric acid](#) (acidity). Other contaminants of concern include radiochemicals ([uranium](#), [radium](#)), [fluoride](#), [chromium](#), [lead](#), [mercury](#), and high levels of dissolved solids. Contaminants of concern at the site may change as new data become available.

Public Health Impact:

Direct exposure to the contaminants could occur from the consumption of contaminated surface water or groundwater, or from the ingestion or inhalation of contaminated soil particles. Water provided by the local water suppliers (the [Arizona Water Company](#), the [City of Globe](#) and others) comes from the deeper regional aquifer and meets both state and federal water quality standards. Residents in unincorporated portions of the county rely on private wells. The Pinal Creek Group has implemented a private well replacement program since 1994 and offers free testing of private wells in the site. Approximately 90 wells have been replaced to date.

Site Hydrogeology:

The Pinal Creek Basin is bounded by the Pinal Mountains to the south and by the Apache Peaks and Globe Hills to the east. The setting is a typical basin and range structure that has northwest-trending ranges of igneous and metamorphic rocks separated by a valley that is filled with alluvial deposits. Consolidated and semi-consolidated basin-fill deposits (known as the Gila Conglomerate) that occur in Pinal Creek were created by late Cenozoic block faulting. Unconsolidated alluvium overlies the Gila Conglomerate and ranges from 300 to 800 meters wide and may be as thick as 50 meters. Major surface water bodies in the basin include Bloody Tanks Wash and Russell Gulch, which join to form Miami Wash, which flows northward into Pinal Creek.



There are two principal aquifers in the basin: the regional Gila Conglomerate [aquifer](#) and the shallow [alluvial](#) aquifer. The Gila Conglomerate aquifer is the main source of water for domestic and industrial use. The Gila Conglomerate contains significant quantities of calcium carbonate which can neutralize acidic water, and is much less permeable than the alluvial aquifer, both of which have helped to protect it from extensive contamination. Contamination by acid-metal bearing water is largely localized within the alluvial aquifer.

Surface water in the basin is mostly ephemeral occurring only in response to precipitation events. Perennial flow in Pinal Creek begins at the north end of the channel where the groundwater table intersects the surface due to a truncation of the alluvial and Gila Conglomerate aquifers by [bedrock](#).

Contacts:

Name	Phone	E-mail
Ed Pond, ADEQ Project Manager	(602) 771-4575*/ (602) 771-4138 fax	pond.edwin@azdeq.gov
Wendy Flood, ADEQ Lead Community Involvement Coordinator	(602) 771-4410*/ (602) 771-4236 fax	flood.wendy@azdeq.gov

*In Arizona, but outside the Phoenix area, call toll-free at (800) 234-5677.

Information Repository:

Interested parties can review select site documents at the Miami Memorial Library located at 1052 Adonis in Miami, AZ, 85539 (928) 473-4403. BHP Copper-Old Dominion Mine files can be found at the Globe Public Library located at 339 S. Broad Street in Globe, AZ, 85501 (928) 425-6111.

The complete official site file is in Phoenix at the ADEQ Central Office located at 1110 W. Washington Street, Phoenix, AZ, 85007. To arrange a time to review the site file at the Phoenix office, please call the ADEQ Records Management Center with 24-hour notice at (602) 771-4380 or (800) 234-5677. Once all documents requested have been collected, you will be contacted for a review Monday through Friday from 8:30 A.M. to 4:30 P.M. at the ADEQ Records Management Center.

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"Model" Wyoming in situ uranium mining operation cited for multiple permit violations

Cameco Corporation, a Canadian company, is world's largest uranium producer; Wyoming regulators note "inordinate number of spills, leaks and other releases", "low level of corporate commitment" to environmental issues, and "groundwater restoration not a high priority"

Posted March 27, 2008, Updated March 29, 2008

Earlier this month, the Wyoming Department of Environmental Quality issued a Notice of Violation to Power Resources Inc. for numerous violations of state permits for in situ leach uranium mining. Power Resources is a wholly-owned subsidiary of Cameco Corporation, a Canadian mining company that is the largest uranium producer in the world, according to the company's website. The two permits in question are for the Highland and Smith Ranch ISL mining operations located in Converse County in east central Wyoming.

The Wyoming investigators' report notes that Highland-Smith Ranch has been the major and only significant uranium producer in the state for many years, and that "there is an expectation that the operation might serve as a model for excellence in ISL mining."

Unfortunately, excellence was not what Wyoming officials found during their investigation last year. Their report is a disturbing recitation of numerous ongoing problems the company has experienced since it started mining uranium at the site in 1988. Problems include spills, pond leaks, well casing failures, and excursions of leaching fluid. Well fields that were supposed to be mined, restored, reclaimed, and decommissioned in 6-10 years have instead taken 20 years. Reclamation bonds posted by Cameco have been underestimated and are woefully inadequate to protect taxpayers. Permits contain inaccurate and outdated information regarding procedures affecting public safety and the environment.

The report is a stunning rebuke of Cameco and its Wyoming ISL operations. Ironically, Powertech Uranium Corp. has recently been involved in arranging tours of Highland-Smith Ranch for selected Colorado politicians and university professors. Presumably, the tours are meant to persuade these influential individuals to support Powertech's Centennial Project. In fact, some of them have returned to Colorado to publicly announce that ISL mining is safe and benign.

The reality is somewhat different. Below are excerpts from the Report of Investigation (the full report follows).

This investigation was conducted at the request of Rick Chancellor, LQD Administrator, in response to concerns over recent spills and the slow pace of groundwater restoration at the Smith Ranch-Highland ISL operation.

Given that PRI's operation has for many years been the major uranium producer in Wyoming, there is an expectation that the operation might serve as a model for excellence in ISL mining. Unfortunately, this is not the case. There are a number of major long-standing environmental concerns at this operation that demand immediate attention.

The approved mining and reclamation schedules are not being followed and are not, current. PRI is not conducting contemporaneous restoration as required by their permit and WDEQ-LQD regulations.

Spill detection, reporting, delineation, remediation, follow-up and tracking protocols are not defined in the permit and should be. PRI experiences spills on a routine basis.

PRI's typical wellfield installation procedures result in the near total disturbance of the native vegetation and soils. This is not consistent with the regulation that allows for "minor disturbance" without topsoil stripping.

It is readily apparent that groundwater restoration is not a high priority for PRI. Reclamation is not contemporaneous with mining. A total of 12 wellfields are now in production and restoration is proceeding (slowly) in only 2 wellfields. Only 2 wellfields (A and B) have been restored in 20 years of operation. The permits project that production will typically last for 3-5 years per wellfield and restoration will take 3-5 years per wellfield. It appears in reality that both production and restoration timeframes have doubled or tripled and yet additional wellfields are being brought into production.

Over the years there have been an inordinate number of spills, leaks and other releases at this operation. Some 80 spills have been reported, in addition to numerous pond leaks, well casing failures and excursions. Unfortunately, it appears that such occurrences have become routine. The LQD currently has two large three-ring binders full of spill reports from the Smith Ranch-Highland operations.

Cumulative tracking of spills and releases is important to insure appropriate follow-up on every incident. Some of the spills may have little impact individually, but cumulatively they might have a significant effect on soils and/or groundwater. A cumulative record will also assist in pinpointing potential problem areas and developing appropriate preventative measures. PRI should develop and implement an inspection and maintenance program designed to prevent future spills.

The reclamation cost estimates contained in PRI's annual reports assume completion of all groundwater and surface reclamation in 4 years with a staff of 28 people (1/4 of current staff), using the existing facilities with the addition of only 2 new 400gpm RO units. This scenario is totally infeasible and unsupported by any critical path timeline or water balance. Rough calculations based primarily on PRI's figures reveal an alarming scenario.

PRI's bond calculation includes minimal funds for new infrastructure, maintenance, replacement and repair. Only two new 400 gpm RO units are included in the bond estimate. The need for new wells, including DDWs, water storage and treatment ponds, additional RO units, membranes, pumps, piping and general wellfield renovation should be anticipated and included in the bond calculation.

PRI's bond calculation assumes a staff of only 28 people, with 22 of them on a salary of only \$34,000 per year! If their current operations require a staff of 100 people then it will take at least 1/2 to 2/3 of that staff to conduct restoration. The restoration operations will look very similar to production operations. Operation of RO units, in particular, is very high maintenance and labor intensive. Retaining competent staff will require that wages and benefits be at least \$50,000 per year.

Considering that reclamation will take several times longer, require at least twice the staff with higher wages and require much greater investments in infrastructure than PRI has estimated, a realistic reclamation cost estimate for this site would likely be on the order of \$150 million, as compared to PRI's current calculation of \$38,772,800. PRI is presently bonded for a total of only \$38,416,500. No bond adjustments have been made since 2002. Clearly the public is not protected. It is recommended that PRI's bond be immediately raised to a level of \$80 million until a thorough evaluation, including critical path analysis, can be completed and an appropriate bonding level established. No permit amendments should be approved or new wellfields authorized until the bonding situation is corrected.



4/12/08 not needed

In-Situ Leach (ISL) Uranium Mining Method Far From 'Benign'

By Dr. Gavin Mudd
Hydrogeologist / Environmental Engineer, Monash University
2007

Text

The mining technique of in situ leaching (ISL), often referred to as solution mining, is becoming an increasingly favoured method for the extraction of uranium across the world. This is primarily due to its low capital and operating costs compared to conventional mining. Little is known about the environmental impact of this method, and mining companies have been able to exploit this to promote the method as "environmentally benign".

The ISL process involves drilling groundwater bores or wells into a uranium deposit, injecting corrosive chemicals to dissolve the uranium within the ore zone, then pumping back the uranium-laden solution.

The method should only be applied to uranium deposits located within a groundwater system or confined aquifer, commonly in palaeochannel deposits (old buried river beds).

Although ISL is presented in simplified diagrams by the nuclear industry, the reality is that geological systems are inherently complex and not easily predictable.

There are a range of options for the chemistry of the mining solutions. Either acidic or alkaline chemical agents can be used in conjunction with an oxidising agent to dissolve the uranium.

Typical oxidising agents include oxygen or hydrogen peroxide, while alkaline agents include ammonia or sodium-bicarbonate or carbon dioxide. The most common acidic chemical used is sulphuric acid, although nitric acid has been tried at select sites and in laboratory tests.

The chemicals can have serious environmental impacts and cause long-term and potentially irreversible changes to groundwater quality.

The use of acidic solutions mobilises high levels of heavy metals, such as cadmium, strontium, lead and chromium. Alkaline solutions tend to mobilise only a few heavy metals such as selenium and molybdenum. The ability to restore the groundwater to its pre-mining quality is, arguably, easier at sites that have used alkaline solution chemistry.

A review of the available literature on ISL mines across the world can easily counter the myths promulgated about ISL uranium mining. Whether one examines the USA, Germany, Russia and former annexed states, Bulgaria, the Czech Republic, Australia or new ISL projects across Asia, the truth remains the same - the ISL technique merely treats groundwater as a sacrifice zone and the problem remains "out of sight, out of mind".

ISL uranium mining is not controllable, is inherently unsafe and is unlikely to meet "strict environmental controls". It is not an environmentally benign method of uranium mining.

The use of sulphuric acid solutions at ISL mines across Eastern Europe, as well as a callous disregard for sensible environmental management, has led to many seriously contaminated sites.

Perhaps the most severe example is Straz pod Ralskem in the Czech Republic, where up to 200 billion litres of groundwater is contaminated. Restoration of the site is expected to take several decades or even centuries. For the USA, solution escapes outside of the 'controlled mining zone' and difficult restorations have been documented at ISL sites in Texas and Wyoming - including both acid and alkaline leach sites. Australia has encountered these same difficulties, especially at the controversial Honeymoon deposit in

South Australia during pilot studies in the early 1980s and at Manyingee in Western Australia until 1985.

The Honeymoon pilot project used sulphuric acid in conjunction with ferric sulphate as the oxidising agent. The wells and aquifer experienced significant blockages due to the minerals jarosite and gypsum precipitating, lowering the efficiency of the leaching process and leading to increased excursions. The aquifers in the vicinity of Honeymoon are known to be connected to aquifers used by local pastoralists to water stock.

For Australia, water of any quality is precious – and particularly so when the only secure supply of water in a region is from groundwater. With the rise of water treatment technologies such as desalination, water of any quality is a valuable resource – environmentally as well as for possible community and industry use. An acid leach-type ISL project, especially as approved for Beverley and Honeymoon without remediation of polluted groundwater, therefore imposes a major environmental risk and pollution burden on future users of groundwater in these regions. ISL mining is therefore far from sustainable.

(Journal articles, conferences papers etc. by Dr. Mudd:
<<http://civil.eng.monash.edu.au/about/staff/muddpersonal>>.)

ENVIRONMENTAL POLLUTION - ROUTINE CONTAMINATION OF GROUNDWATER

This summary is drawn from the Friends of the Earth, Australia submission to the Beverley Four Mile uranium mine application, March 2009.

In-situ leach (ISL) uranium mining involves pumping an acid solution (or an alkaline solution in some cases) into an aquifer. This dissolves the uranium ore and other heavy metals and the solution is then pumped back to the surface. The small amount of uranium is separated at the surface. The liquid radioactive waste - containing radioactive particles, heavy metals and acid - is simply dumped in groundwater.

The 2004 CSIRO report states:

"As stated in the Beverley Assessment Report, the bleed solutions, waste solutions from uranium recovery, plant washdown waters and bleed streams from the reverse osmosis plants are collected prior to disposal into the Namba aquifer via disposal wells. These liquid wastes are combined and concentrated in holding/evaporation ponds, with excess injected into selected locations within the mined aquifer. The injected liquid is acidic (pH 1.8 to 2.8) and contains heavy metals and radionuclides originating from the orebody."

(Taylor, G.; Farrington, V.; Woods, P.; Ring, R.; Molloy, R. (2004): Review of Environmental Impacts of the Acid In-Situ Leach Uranium Mining Process.- CSIRO Land and Water Client Report.)

From being inert and immobile in the ore body, the radionuclides and heavy metals are now bioavailable and mobile in the aquifer.

The volume of liquid waste is discussed in the 7/1/09 *Beverley Four Mile Project Public Environment - Report and Mining Lease Proposal* document:

"With the inclusion of maximised recycling of water, approximately 2.5 L/s (averaged over a year) of liquid waste will be generated once the Beverley extraction circuits are decommissioned. This will be disposed of at Beverley ML 6321 in the hydraulically isolated formerly mined Beverley Sands aquifers in

Acid spill from mine halted near Clifton

November 01, 2008 12:00 am

• By Tony Davis Arizona Daily Star, 806-7746 or tdavis@azstarnet.com

About 168,000 gallons of a corrosive sulfuric-acid-based solution spilled out of a copper mine in Morenci into a neighboring creek and almost reached the San Francisco River, officials said.

Thursday's spill from the Freeport McMoran Copper and Gold mine in Eastern Arizona's Greenlee County flowed about two miles down Chase Creek to about 120 feet from the San Francisco River.

The liquid was stopped there by four earthen dams that workers for the copper company built after the spill started.

The flow of the deep blue, foul-smelling, copper-sulfuric-acid blend was contained within an hour after the spill was discovered early Thursday afternoon, said Ray Pini, city manager of neighboring Clifton.

As of late Friday, authorities hadn't determined the spill's cause. State Department of Environmental Quality officials were investigating to see if the mining company had violated state water quality laws.

The sulfuric acid solution, used to leach copper out of copper ore, is harmful if swallowed, can cause severe skin and eye burns and may harm aquatic life, says a safety report on the compound that Pini said he obtained from a Greenlee County Homeland Security officer.

The mining company is making an all-out effort to clean up the spill, having pumped the contaminated liquid from the creek and started to haul away contaminated soil, said a Freeport spokesman and the Clifton city manager.

"We apologize to citizens of Clifton, to anyone disturbed by this activity. We're distressed that this incident occurred. We will revise our practices and other operations to make sure it doesn't occur again," Freeport spokesman Richard Peterson said Friday afternoon.

Pini said he heard that the spill occurred after a person working at the mine opened the wrong valve, allowing the acidic solution to escape into the creek. "I would preface that by saying, I'm not exactly sure but that's the story that I heard," Pini said.

Peterson said the spill was caused by human error and that he doesn't know if the story Pini recounted is true.

If company officials hadn't acted as quickly as they did, the spill would have been a serious discharge into the San Francisco, a tributary of the Gila River from which a few local residents catch catfish, Pini said.

"They handled this situation very professionally and were able to create barriers along Chase Creek that allowed containment of the solution," the manager said.

The spill shows that while mining companies often say that the days of mining-related contamination have passed due to new technologies, "the bottom line is that it is still a messy, messy business," said environmentalist Sandy Bahr, conservation outreach director for the Sierra Club's Grand Canyon chapter.

"Without the proper regulations, the proper protections, you could destroy a waterway," Bahr added. "You can't have a regulation to prevent someone from opening the wrong valve, but you can have redundancies in the system so that if somebody turns on the wrong valve you have a safety mechanism."

A spokesman for ADEQ said the state's efforts are now focused on cleaning up the pollution, and that the agency has sent three inspectors to the site.

It will look later at the proper administrative actions to take regarding this situation, agency spokesman Mark Shaffer said.

Besides possible water-quality law violations, the state will also determine if the company violated its aquifer-protection permit, Shaffer said. Such permits are aimed at ensuring companies don't allow chemicals to pollute groundwater.

DID YOU KNOW

In 1986, Freeport's predecessor, Phelps Dodge Corp., agreed to pay a \$1 million penalty and spend up to \$9 million building a system to stop pollution from its mining complex into Chase Creek and a neighboring gulch in Morenci. The agreement settled a federal lawsuit that had accused the company of violating the Clean Water Act on six occasions from 1969 through 1985. The company didn't admit wrongdoing.

The lawsuit complained that Phelps Dodge had regularly dumped rock, sand and low-grade ore into Chase Creek. Runoff in the creek would flow through mine dumps and become acidic, leaching a number of toxic heavy metals from those dumps and carrying them downstream. The agreement prohibited any future discharge from the mine into the creek. The company agreed to capture all water in Upper Chase Creek above the mine and divert it around the middle part of the creek near the mine and into a portion below the mine.

Gregory Mendoza
Governor



Stephen Roe Lewis
Lieutenant Governor

GILA RIVER INDIAN COMMUNITY
Executive Office

May 3, 2012

"A New Generation of Leadership Serving the People"

The Honorable Janice K. Brewer
Arizona Governor
Executive Tower
1700 West Washington Street
Phoenix, Arizona 85007

Re: *Opposition to the Florence Copper Project*

Dear Governor Brewer:

We write to express our deep concern about the Curis Resources Ltd.'s proposed mining project in the Town of Florence, Pinal County, Arizona, known as the Florence Copper Project. Curis proposes the use of a potentially dangerous and unprecedented form of mining called *in situ* leach mining, the likes of which have not been attempted on a commercial scale in the United States.

The Florence Copper Project is located in the heart of the town of Florence near current and future residential development. The proposed project is also located on the Gila River and upstream from the Gila River Indian Community. The possibility of groundwater contamination, as well as other potentially unsafe hazards often associated with unproven mining technologies, presents too great a risk for the Community and its members, habitants of the town of Florence, and surrounding areas.

The Community worked hard to secure its water rights to the Gila River; the Community understands how precious water is to our Community, to the Town of Florence as well as to the environment. Thus, the Gila River Indian Community is proud to support our neighbors, the Town of Florence, in opposing the Florence Copper Project.

Sincerely,

A handwritten signature in black ink, appearing to read "Gregory Mendoza".

Gregory Mendoza, Governor
Gila River Indian Community

Non-responsive



Non-responsive



FLORENCE COPPER MINE ON HOLD

State Water Quality Appeals Board Rejects

Florence Copper Mine Permit

TGB
12/16 - 12/18

EPS - 12/18 Total Perennial 371 m

The Arizona Water Quality Appeals Board rejected the Temporary Aquifer Protection Permit that Florence Copper Inc. (FCI) had received and sent it back to Arizona Department of Environmental Quality (ADEQ) for a complete overhaul. According to press releases and newspaper reports, the Board agreed with Administrative Law Judge (ALJ) Diane Mihalsky that ADEQ acted unreasonably, arbitrarily, unlawfully and with clearly invalid technical judgment in issuing the permit. "The permit would have given them permission to inject large quantities of sulfuric acid where the aquifer is located," said Larry Crown, an attorney for Florence, Pulte Homes, Southwest Value Partners and Johnson Utilities, all opponents of the mine.

Numerous inadequacies and defects found:

- ADEQ failed to consider readily available data and information from the previously conducted pilot test which ADEQ needed to analyze in its evaluation of FCI's proposals and assumptions.
- In light of potential contaminant movement and travel times, the permit failed to require meaningful monitoring that would detect escapes of mining contaminants during the life of the pilot test, in violation of clear statutory requirements.
- Because evidence presented at the hearing demonstrated the potential for rapid vertical migration of mining contaminants into the drinking water aquifer, ADEQ's failure to require any monitoring for vertical escapes was arbitrary, unreasonable and scientifically indefensible.
- ADEQ's reliance on a single downgradient monitoring well to detect escapes of acid mining solution during pilot test operations was unreasonable and scientifically indefensible, given the potential for contaminants to move in many different directions through fractures and faults.



- The wells selected by ADEQ and FCI to monitor for escapes of acid mining solutions for purposes of enforcement were so far from the mine area that ADEQ would not know whether the drinking water aquifer had been contaminated until many years after FCI finished pilot testing.
- The Pollutant Management Area (PMA) - the only area in which pollutants would be allowed - was grossly oversized in relation to the small pilot test area and was therefore unlawful. A new PMA will have to be tightly drawn around the actual mine block to comply with state law.
- ADEQ's process for defining the PMA and selecting the interconnected permit enforcement locations ignored clear statutory requirements and ADEQ's over-arching duty to protect groundwater resources. Belated attempts created at the hearing by ADEQ and FCI to justify these distant locations lacked credibility.
- The Board was critical that FCI submitted closure plans supported by professionally sealed documents without ever intending to use them.
- ADEQ'S issuance of the permit, knowing that FCI'S changed closure plan was not supported by professionally sealed documents was unreasonable, arbitrary, and unlawful. The Board recognized that the permit application is an important public document and the public has the right to rely on its contents.

The Board's decision validates the significant questions and concerns raised by the Mayor and Council of the Town of Florence plus its residents and other interested parties including Johnson Utilities over the last five years. Public opposition pushed ADEQ to closely evaluate FCI's original commercial mine application, with ADEQ finding 91 DEFICIENCIES in FCI's original proposal. Unable to answer all of ADEQ'S questions, FCI requested ADEQ to suspend its commercial application. FCI then tried a new application for a small, short-term pilot test facility on State trust land. Although ADEQ approved a fundamentally-flawed permit for a test facility, strong public opposition in the form of written and public comments followed by the intense scrutiny of this appeal resulted in that defective permit being overturned.

Following the Board's latest ruling, FCI will now have to submit previously withheld information to ADEQ, along with revised application materials to address the numerous critical problems identified by the Board. ADEQ must then conduct entirely new analysis of the information, complying with all legal requirements, and if it can, draft a revised permit for public review and comment. If, after public review, ADEQ decides to issue a revised permit for PTF operations, that permit would be subject to additional appellate review. Furthermore, FCI has yet to receive a federal Underground Injection Control (UIC) permit from the EPA, whose review of the permit request continues. The federal permit will be subject to its own public review and comment process, as well as a separate appeals process.

All of this has to take place before FCI can inject a single drop of pollution into the aquifer.
While this takes place, the suspended commercial permit application with its 91 deficiencies will remain on hold.

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